



LaSalle County Station
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10 CFR 50.73

RA17-030

March 24, 2017

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

LaSalle County Station, Unit 2
Renewed Facility Operating License No. NPF-18
NRC Docket No. 50-374

Subject: Licensee Event Report 2017-001-00, Manual Reactor Scram due to
Turbine-Generator Run-Back Caused by Stem-Disc Separation in Stator
Water Cooling Heat Exchanger Inlet Valve

In accordance with 10 CFR 50.73(a)(2)(iv)(A), Exelon Generation Company, LLC
(EGC) is submitting Licensee Event Report (LER) Number 2017-001-00 for LaSalle
County Station, Unit 2.

There are no regulatory commitments in this letter. Should you have any questions
concerning this report, please contact Mr. Guy V. Ford, Jr., Regulatory Assurance
Manager, at (815) 415-2800.

Respectfully,

A handwritten signature in black ink that reads "Harold T. Vinyard".

Harold T. Vinyard
Plant Manager
LaSalle County Station

Enclosure: Licensee Event Report

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – LaSalle County Station



LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollcts.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME

LaSalle County Station, Unit 2

2. DOCKET NUMBER

05000374

3. PAGE

1 OF 3

4. TITLE

Manual Reactor Scram due to Turbine-Generator Run-Back Caused by Stem-Disc Separation in Stator Water Cooling Heat Exchanger Inlet Valve

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
01	23	2017	2017	001	00	03	24	2017	NA	NA
9. OPERATING MODE										
11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)										
1			<input type="checkbox"/> 20.2201(b)			<input type="checkbox"/> 20.2203(a)(3)(i)			<input type="checkbox"/> 50.73(a)(2)(ii)(A)	
			<input type="checkbox"/> 20.2201(d)			<input type="checkbox"/> 20.2203(a)(3)(ii)			<input type="checkbox"/> 50.73(a)(2)(ii)(B)	
			<input type="checkbox"/> 20.2203(a)(1)			<input type="checkbox"/> 20.2203(a)(4)			<input type="checkbox"/> 50.73(a)(2)(iii)	
			<input type="checkbox"/> 20.2203(a)(2)(i)			<input type="checkbox"/> 50.36(c)(1)(i)(A)			<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	
10. POWER LEVEL			<input type="checkbox"/> 20.2203(a)(2)(ii)			<input type="checkbox"/> 50.36(c)(1)(ii)(A)			<input type="checkbox"/> 50.73(a)(2)(v)(A)	
			<input type="checkbox"/> 20.2203(a)(2)(iii)			<input type="checkbox"/> 50.36(c)(2)			<input type="checkbox"/> 50.73(a)(2)(v)(B)	
			<input type="checkbox"/> 20.2203(a)(2)(iv)			<input type="checkbox"/> 50.46(a)(3)(ii)			<input type="checkbox"/> 50.73(a)(2)(v)(C)	
			<input type="checkbox"/> 20.2203(a)(2)(v)			<input type="checkbox"/> 50.73(a)(2)(i)(A)			<input type="checkbox"/> 50.73(a)(2)(v)(D)	
			<input type="checkbox"/> 20.2203(a)(2)(vi)			<input type="checkbox"/> 50.73(a)(2)(i)(B)			<input type="checkbox"/> 50.73(a)(2)(vii)	
			<input type="checkbox"/> 50.73(a)(2)(i)(C)			<input type="checkbox"/> OTHER Specify in Abstract below or in NRC Form 366A				

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT

Joe Fiesel, Maintenance Director

TELEPHONE NUMBER (Include Area Code)

(815) 415-2500

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
B	TJ	ISV	C665	Y	NA	NA	NA	NA	NA

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE) ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR
NA	NA	NA

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On January 23, 2017, operators initiated a manual scram of the LaSalle County Station Unit 2 reactor as a result of observing a generator run-back due to a generator stator winding cooling (GC) system malfunction. Initial troubleshooting identified the most likely cause was plugging in the 'A' GC heat exchanger, based on inspection of the GC system flow-path components. The GC system was realigned to the 'B' heat exchanger until inspections could be performed in the upcoming refueling outage, and the unit was re-started on January 24, 2017.

Further inspections of the GC components were performed while the unit was shut down for a planned refueling outage. These inspections determined the cause of the GC system failure was stem-disc separation in the 'A' GC heat exchanger inlet valve. The valve was repaired during the refueling outage.

This event is reportable in accordance with 10 CFR 50.73(a)(2)(iv)(A) as an event or condition that resulted in manual or automatic actuation of the Reactor Protection System (RPS). There were no safety consequences associated with the event since there was no loss of safety function, and the RPS functioned as designed.

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

(See NUREG-1022, R.3 for instruction and guidance for completing this form
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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
LaSalle County Station, Unit 2	05000374	2017	- 001	- 00

NARRATIVE**PLANT AND SYSTEM IDENTIFICATION**

LaSalle County Station Unit 2 is a General Electric Boiling Water Reactor with 3546 Megawatts Thermal Rated Core Power.

The affected system was the generator stator winding cooling (GC) system, which supports main generator reliability by removing heat from the generator field rectifiers and generator terminal bushings. The GC system supplies cooling water from one of two pumps in combination with one of two heat exchangers.

CONDITION PRIOR TO EVENT

Unit(s): 2
Reactor Mode(s): 1

Event Date: January 23, 2017
Mode(s) Name: Power Operation

Event Time: 0806 CST
Power Level: 99 percent

DESCRIPTION OF EVENT

On January 23, 2017, LaSalle County Station Unit 2 was in Mode 1 at 99 percent, while in coast-down for a scheduled refueling outage. At 0806 hours CST, operators inserted a manual scram, in accordance with station procedures, in response to a GC system malfunction and generator load run-back. The unit was placed in a stable condition with all control rods fully inserted. Reactor pressure was maintained with the turbine bypass valves, and reactor water level was controlled using the main feedwater system.

At the time of the event, stator water cooling was being provided by the 'B' GC pump aligned to the 'A' GC heat exchanger. The event was preceded by unexpected alarms with the GC and electro-hydraulic control (EHC) systems. Field operators reported that local alarms were observed for stator inlet flow, stator inlet pressure, and stator outlet temperature.

CAUSE OF EVENT

Initial investigation found the 'B' GC pump had been running with a higher than normal discharge pressure as indicated on a local gauge between the pump and the discharge check valve. Further investigation found evidence that limited cooling water flow to the generator existed, suggesting that blockage or a stem-to-disc separation of an upstream valve had occurred. Thermography, visual inspection, borescope inspection, and testing of all valves in the normal flow-path from the 'B' GC pump and the 'A' heat exchanger to the pressure control valve indicated that the most likely cause was plugging in the 'A' heat exchanger. Additional inspections of the GC system were performed during the scheduled refueling outage in order to ascertain a more definitive cause. These inspections determined the cause of the GC system failure was stem-disc separation in the 'A' GC heat exchanger inlet valve 2GC-Y08.

The preliminary results from the root cause investigation indicate the likely cause of the stem-disc separation was due to maintenance activities from a valve disassembly performed in 2003 for a suspected leak-by. If the investigation reveals insights or cause different than described in this LER, a supplement will be provided.

REPORTABILITY AND SAFETY ANALYSIS

This event is reportable in accordance with 10 CFR 50.73(a)(2)(iv)(A) as an event or condition that resulted in a manual or automatic actuation of the Reactor Protection System (RPS). There was no safety consequences associated with the event since all equipment functioned as designed to shut down the reactor and operational and safety limits were maintained within margin to place the unit into safe shutdown condition.

The main generator provides electrical power from the motive force supplied by the main turbine. The main generator consists of a rotor, bearings, stator, collector rings, brushes, and high-voltage bushings. One of the support systems for the main generator is the GC system. Since the turbine and generator are used together, the main turbine is designed with several trip signals, including a loss of GC.

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NARRATIVE

In this event, the digital EHC (DEHC) system detected the conditions for generator run-back (two-of-two low pressure switches closed) and initiated a run-back. During a run-back, after a 15-second delay the DEHC system is designed to reduce the load reference at 30 percent per minute from the normal full power load reference of 105 percent. This caused the control valves to close, which caused the reactor pressure to rise and the bypass valves to open. Approximately 54 seconds after the run-back was initiated, a manual scram was inserted, which reduced reactor pressure and allowed the bypass valves to close. The DEHC system functioned as expected.

CORRECTIVE ACTIONS

Initial investigation found evidence that limited cooling water flow to the generator existed, and testing of all valves in the normal flow-path from the 'B' GC pump and the 'A' heat exchanger to the pressure control valve indicated that the most likely cause was plugging in the 'A' heat exchanger. An extent of condition review was performed for the opposite unit's GC system and associated valves and controllers. A review of GC heat exchanger preventative maintenance for both units indicated all tasks were current, with no outstanding corrective work orders. Additionally, a review of corrective work orders on the GC valves at LaSalle indicated they were related to leak-by issues and not tube plugging.

Additional inspections of the GC system were performed during the scheduled refueling outage in order to ascertain a more definitive cause. These inspections determined the cause of the GC system failure was stem-disc separation in the 'A' GC heat exchanger inlet valve 2GC-Y08. The valve was repaired during the refueling outage, which restored the system. The extent of condition applied to the 'B' train GC heat exchanger inlet valve 2GC-Y09, which was disassembled and inspected as part of the troubleshooting plan, due to its operation under similar conditions. Similarly, the GC heat exchanger outlet valves were inspected (2GC-Y11) or replaced (2GC-Y10). Unit 1 GC heat exchanger inlet and outlet valves are scheduled for the next Unit 1 refueling outage for stem-disc replacements.

PREVIOUS OCCURRENCES

A review of LaSalle Station Licensee Event Reports for the past three years, related to reactor trips, identified instances where a reactor manual or automatic scram was inserted; however, no previous occurrences related directly to turbine controls or the GC system operation at LaSalle Station were identified. Valve stem-disc separation issues have occurred at LaSalle Station, including the following event.

- LER 374-2014-001-00:
On August 5, 2014, Unit 2 automatically scrammed from 100 percent power on high neutron flux, followed by a Group I containment isolation. Troubleshooting of the 2C Main Steam Isolation Valve (MSIV) determined that the valve stem-disc had separated from the stem, which allowed the main disc to drop into the main steam's flow-path. The cause of the stem-disc separation on the 2C MSIV was fretting wear attributable to marginal design. The root cause of the event was a legacy decision made in 2008 deferring installation of a manufacturer upgrade that would have prevented the failure. Corrective actions included installing the upgrade on all MSIVs on both units, and reviewing previous deferral decisions made using the same decision-making process.

COMPONENT FAILURE DATA

Manufacturer: Crane [C665] / Alloyco [A200]
Device: 90-Degree Angle, Globe, 6-Inch [Model 336-B-SP]
Component ID: Crane Part Number PN 31196